

WHAT IS CLAIMED IS:

1        1. An abrasive comprising a slurry comprising  
2        a medium and cerium oxide particles dispersed in said medium  
3        constituted of at least two crystallites and having crystal  
4        grain boundaries.

1        2. ~~The abrasive according to claim 1, wherein said  
2        cerium oxide particles having crystal grain boundaries have  
3        diameter with a middle value of from 60 nm to 1,500 nm.~~

1        3. ~~The abrasive according to claim 1, wherein said  
2        cerium oxide particles having crystal grain boundaries have  
3        diameter with a middle value of from 100 nm to 1,200 nm.~~

1        4. ~~The abrasive according to claim 1, wherein said  
2        cerium oxide particles having crystal grain boundaries have  
3        diameter with a middle value of from 300 nm to 1,000 nm.~~

1        5. ~~The abrasive according to any one of claims 1 to  
2        4, wherein said crystallites have diameter with a middle  
3        value of from 5 nm to 250 nm.~~

1        6. ~~The abrasive according to any one of claims 1 to  
2        4, wherein said crystallites have diameter with a middle  
3        value of from 5 nm to 150 nm.~~

1           7. The abrasive according to claim 4, wherein said  
2    crystallites have diameter with a middle value of from 10 nm  
3    to 50 nm.

1           8. The abrasive according to claim 4, wherein said  
2    crystallites have diameter with a middle value of from 50 nm  
3    to 200 nm.

1           9. The cerium oxide abrasive according to any one of  
2    claims 1 to 8, wherein said cerium oxide particles having  
3    crystal grain boundaries have a maximum diameter not larger  
4    than 3,000 nm.

1           10. The cerium oxide abrasive according to any one  
2    of claims 1 to 9, wherein said crystallites have a maximum  
3    diameter not larger than 600 nm.

1           11. An abrasive comprising a slurry comprising a  
2    medium and abrasive grains having pores which are dispersed  
3    in said medium.

1           12. The abrasive according to claim 11, wherein said  
2    abrasive grains have a porosity of from 10% to 30% as  
3    determined from the ratio of a true density measured with a  
4    pycnometer to a theoretical density determined by X-ray  
5    Rietveld analysis.

1           13. The abrasive according to claim 11 or 12,  
2 wherein said abrasive grains have a pore volume of from 0.02  
3 cm<sup>3</sup>/g to 0.05 cm<sup>3</sup>/g as measured by the B.J.H. method.

1           14. The abrasive according to any one of claims 11  
2 to 13, wherein said abrasive grains are cerium oxide  
3 particles.

1           15. An abrasive comprising a slurry comprising a  
2 medium and dispersed therein cerium oxide particles having a  
3 bulk density not higher than 6.5 g/cm<sup>3</sup>.

1           16. The abrasive according to claim 15, wherein  
2 said bulk density is from 5.0 g/cm<sup>3</sup> to 5.9 g/cm<sup>3</sup>.

1           17. The cerium oxide abrasive according to any one  
2 of claims 1 to 16, wherein said medium is water.

1           18. The cerium oxide abrasive according to any one  
2 of claims 1 to 17, wherein said slurry contains a  
3 dispersant.

1           19. The cerium oxide abrasive according to claim 18,  
2 wherein said dispersant is at least one selected from a  
3 water-soluble organic polymer, a water-soluble anionic  
4 surfactant, a water-soluble nonionic surfactant and a

5 water-soluble amine.

1           20. The cerium oxide abrasive according to claim 19,  
2 wherein said dispersant is a polyacrylic acid type polymer.

1           21. The abrasive according to claim 1, wherein;  
2           cerium oxide particles with a diameter not smaller  
3 than 1  $\mu\text{m}$  occupies at least 0.1% by weight of the total  
4 weight of the cerium oxide particles; and  
5           said cerium oxide particles having crystal grain  
6 boundaries have the nature of polishing a target member  
7 while collapsing.

1           22. The abrasive according to claim 1, wherein said  
2 cerium oxide particles having crystal grain boundaries have  
3 the nature of polishing a target member while forming new  
4 surfaces not coming into contact with any medium.

1           23. The abrasive according to claim 1, wherein the  
2 content of cerium oxide particles having a particle diameter  
3 not smaller than 0.5  $\mu\text{m}$  after polishing, measured by  
4 centrifugal sedimentation after a target member has been  
5 polished, is in a ratio of not more than 0.8 with respect to  
6 that content before polishing.

1           24. The abrasive according to claim 1, wherein

2 cerium oxide particle diameter at D99% by volume measured by  
3 laser diffraction after a target member has been polished is  
4 in a ratio of from 0.4 to 0.9 with respect to that particle  
5 diameter before polishing.

1 25. The abrasive according to claim 1, wherein  
2 cerium oxide particle diameter at D90% by volume measured by  
3 laser diffraction after a target member has been polished is  
4 in a ratio of from 0.7 to 0.95 with respect to that particle  
5 diameter before polishing.

1/1st 26. A method of polishing a target member,  
2 comprising polishing a target member by the use of the  
3 abrasive according to any one of claims 1 to 25.

1 27. The method of polishing a target member  
2 according to claim 26, wherein said target member has a  
3 strength higher than the grain boundary breaking strength of  
4 the cerium oxide particles.

1 28. The method of polishing a target member  
2 according to claim 26, wherein said target member is a  
3 semiconductor chip on which a silica film has been formed.

1/1st 29. A process for producing a semiconductor device,  
2 comprising the step of polishing a semiconductor chip on

3 which a silica film has been formed, by the use of the  
4 abrasive according to any one of claims 1 to 25.